Refrigerator Comprising a Regenerator

PATENT CLAIMS

1. Refrigerator (1) comprising a housing (2, 14, 19), a cylindrical working chamber (15, 21), a cylindrical displacing member (11, 17), a gap (36, 38) which is located between the housing and the displacing member, a regenerator which is disposed inside the displacing member, and a device alternatingly supplying the working chamber with an effective high-pressure gas and an effective low-pressure gas, **wherein** to the gap (36, 38) a further regenerator (43) (gap gas regenerator) is assigned.

2. Refrigerator in accordance with claim 1, **wherein** it is of a two-stage design and where its second stage is equipped with the gap gas regenerator (43).

3. Refrigerator in accordance with claim 1 or 2, **wherein** the gap gas regenerator (43) is a single layer wire coil extending in the axial direction, said coil being arranged on the side of the gap in the housing wall (22, 23) of the displacing member and/or on the gap side within the housing wall (14, 19) of the refrigerator housing.

4. Refrigerator in accordance with claim 1 or 2, **wherein** the gap gas regenerator (43) is accommodated in a hollow chamber (44) which is located in the housing (22, 23) of the displacing member (9, 17).

5. Refrigerator in accordance with claim 4, **wherein** the hollow chamber (44) is linked to the gap (36, 38) through axially spaced radial bores (45, 46) were there is located between the openings of the radial bores (45, 46) in the gap (36, 38) a seal (47) and where the pressure drop across the seal (47) is greater than the pressure drop across the regenerator (43).

6. Refrigerator in accordance with claim 2 and one of the claims 4 or 5, **wherein** the hollow chamber (44) for the gap gas regenerator (43) is located in the area of the warm end of the displacing member (17)[5] of the second stage.

7. Refrigerator in accordance with claim 6, **wherein** a further seal (48) is provided which, with reference to the position of the seal (47), is[6] located at the warm end of the displacing member (18).

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[5] **Translator's note:** The German text states "18" here whereas "17" would be more in line with the drawing figures and the remainder of the text. Therefore "17" has been assumed for the translation.

[6] **Translator's note:** The German text states "... vorgesehen ist, die in Bezug auf die Lage der Dichtung (47) am warmen Ende des Verdrängers (18) befindet." whereas "... vorgesehen ist, die sich in Bezug auf die Lage der Dichtung (47) am warmen Ende des Verdrängers (18) befindet." would be correct. Therefore the latter has been assumed for the translation.